

In the Specification:

Please amend the specification as follows:

Page 1, first paragraph:

CROSS-REFERENCE TO RELATED APPLICATIONS

The present invention claims priority from Finnish patent application 20035115 filed 30 June 2003 and is the U.S. National Phase under 35 U.S.C. § 371 of PCT/FI2004/050106 filed 24 June 2004.

Field of the Invention

The present invention relates to a method for transmitting signals in a circuit board, in which at least one optical channel is formed, to which an optical signal is input with an optical transmitter and the optical signal input to the optical channel is received with at least one optical receiver.

The invention also relates to a circuit board, in which at least one optical channel, at least one optical transmitter in an optical connection with the optical channel, and at least one optical receiver in an optical connection with the optical channel are formed.

Background of the Invention

Page 2, last paragraph:

Summary of the Invention

One purpose of the present invention is to improve the prior art and to provide a method for transmitting signals in a circuit board and a circuit board, where the problems of prior art have been aimed to be eliminated. The invention is based on the idea that the optical channel formed in the circuit board is designed in such a manner that at least two focal points are optically formed in the optical channel. Each transmitter and receiver is placed in one such focal point, in which case the signal is transmitted as efficiently as possible between the optical channel and the transmitter/receiver. To put it more precisely, the method according to the present invention is primarily characterized in that the optical channel is designed in such a manner that at least two focal points are formed in it, and each optical transmitter is placed substantially in connection with one focal point and the optical receiver is placed substantially in connection with another focal point. The circuit board according to the present invention is primarily characterized in that the optical channel is designed in such a manner that it comprises at least two focal points, and that the optical transmitter is arranged to be placed substantially in connection with one focal point and the optical receiver is arranged to be placed substantially in connection with another focal point.

Paragraph bridging pages 4 and 5:

Description of Embodiments of the Invention

Figure 1 shows a top view of the circuit board according to an advantageous embodiment of the invention. This circuit board 1 comprises one optical channel 2, which is designed in such a manner that it comprises two optical focal points 3. An optical transmitter 4 is placed at the location of the first focal point 3.1 of these (Fig. 2a). The optical signal formed by this optical transmitter 4 radiates from the transmitter laterally, i.e. in this case in the direction of the main level of the optical channel of the circuit board. Since the optical transmitter 4 is placed in the first focal point 3.1, at the same time it means that substantially all of the optical signal radiating from the optical transmitter is directed at a certain direction in the optical channel. This is not substantially affected by which direction the signal of the optical transmitter leaves to. However, all the possible radiation directions do not necessarily cause the reflection of the beam from the edge of the optical channel, if the angle of incidence of the beam is larger than the critical angle of the so-called total reflection. However, if the edge of the optical channel (i.e. the surface of the optical channel perpendicular to the main level) is formed as a reflecting, e.g. a mirror surface, all the beams reflect from the edge. Some routes of the optical signal are marked with arrows 5 in Fig. 1. The second focal point 3.2 is placed in such a manner that the first and second focal points form a kind of a focal point pair. In connection with this invention this means that the optical signal leaving from either focal point drifts to the other focal point substantially independently of the angle of departure the optical signal has in relation to the optical channel in the main level of the optical channel 2. This main level of the optical channel refers here to that level, which is substantially parallel to the level surface of the circuit board, because the optical layer is formed in the circuit board.